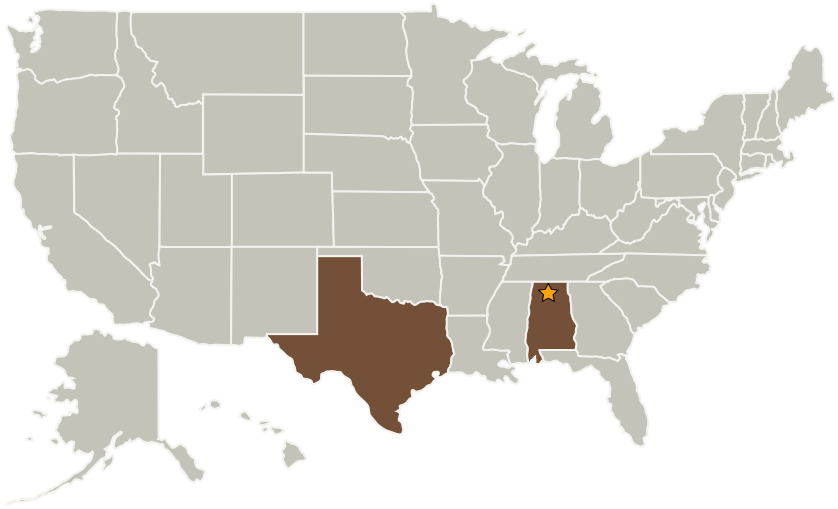
Lunar In-Situ Fabrication: The Manufacturing of Thin Film Solar Cells on the Surface of the Moon, Phase I

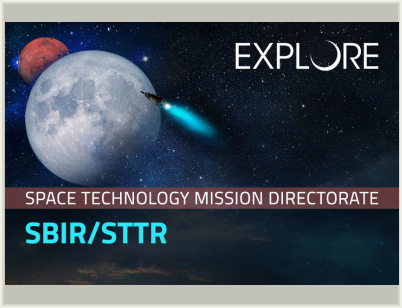
Completed Technology Project (2006 - 2006)

Project Introduction

The utilization of space resources can enable sustained affordable exploration of the Moon and beyond in the nation's Exploration Initiative. The availability of low-cost, abundant indigenous electric power is critical to the aggressive implementation of space resource utilization. This power-rich space environment can be achieved by the generation of electrical power from thin film photovoltaic solar cells produced on the surface of the Moon from lunar resources. This concept of operation offers a specific advantage in the capability of continuous power growth by addition of solar cells, manufactured in situ, to an expanding power grid. Such an effective power system on the Moon would lower operational risks of future robotic and manned missions through higher reliability. In addition, such architecture has the capability to deliver power at a decreasing cost per kWh beyond the first 100 kWh or so. We propose the development of the key thin film silicon solar cell technologies needed to demonstrate the fabrication of thin-film solar cells on the surface of the Moon, and to present a preliminary design of a roving vehicle to support these operations.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Nano EnerTex	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Houston, Texas

Primary U.S. Work Locations	
Alabama	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.3 Surface Construction and Assembly